

Search Plan and Results

Question

[What effect does consuming natural \(ruminant\) vs. synthetic \(industrially hydrogenated\) trans fatty acids have on LDL-, HDL- and non-HDL cholesterol? \(DGAC 2010\)](#)

Date Searched

05-06-09

Inclusion Criteria

Subjects/Population

Age: Two years to adult.

Setting: US and International.

Health Status: Healthy and those with elevated chronic risk (CHD/CVD, type 2 diabetes, metabolic syndrome, and obesity).

Nutrition Related Problem/Condition:

Search Criteria

Study Design Preferences: Randomized controlled trial (RCT) or clinical controlled studies, large non-randomized observational studies, cohort, meta-analysis and systematic reviews.

Size of Study Groups: The sample size must be equal to 10 adults for each study group. (For example, this would include 10 patients in the Intervention group and 10 patients in the control or comparison group).

Study Dropout Rate: Less than 20%; preference for smaller dropout rates.

Year Range: January 2004 to May 2009.

Authorship: If an author is included on more than one review article or primary research article that is similar in content, the most recent review or article will be accepted and earlier versions will be rejected.

Languages: Limited to articles in English.

Other: Article must be published in peer-review journal.

Exclusion Criteria

Subjects/Population

Age: Infants less than two years.

Setting: Inpatients.

Health Status: None.

Nutrition Related Problem/Condition: Eating disorders.

Search Criteria

Study Design Preferences: Not applicable.

Size of Study Groups: <10.

Study Dropout Rate: If the dropout rate in a study is 20% or greater, the study will be rejected.

Year Range: Prior to 2000.

Authorship: Studies by same author similar in content.

Languages: Articles in English.

Other: Animal studies; abstracts or presentations.

Search Terms: Search Vocabulary

Limits: Added to PubMed in the last five years, published in the last five years, only items with links to full text, only items with links to free full text, only items with abstracts, Humans, Male, Female, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review, English, Systematic Reviews, MEDLINE, PubMed Central, All Adult: 19+ years, Pre-school Child: Two to five years, Child: Six to 12 years, Adolescent: 13-18 years, Adult: 19-44 years, Middle Aged: 45-64 years

LDL; HDL; non-HDL cholesterol; natural trans fatty acids; synthetic; industrial; post-prandial lipemia; plasma lipoproteins; blood; metabolism; dietary fat.

Electronic Databases

Total hits from all electronic database searches: 62

Total articles identified to review from electronic databases: 20

Articles Identified Via Handsearch or Other Means

Summary of Articles Identified to Review

Number of Primary Articles Identified: 2

Number of Review Articles Identified: 1

Total Number of Articles Identified: 3

Number of Articles Reviewed but Excluded: 17

List of Articles Included for Evidence Analysis

Review Articles:

Jakobsen MU, Bysted A, Andersen NL, Heitmann BL, Hartkopp HB, Leth T, Overvad K, Dyerberg J. [Intake of ruminant trans fatty acids and risk of coronary heart disease-an overview](#). *Atheroscler Suppl*. 2006 May; 7 (2): 9-11. Epub 2006 May 18. *Review*. PMID:16713389.

Research Articles:

Motard-Bélanger A, Charest A, Grenier G, Paquin P, Chouinard Y, Lemieux S, Couture P, Lamarche B. [Study of the effect of trans fatty acids from ruminants on blood lipids and other risk factors for cardiovascular disease](#). *Am J Clin Nutr*. 2008 Mar; 87 (3): 593-599. PMID:18326596.

Chardigny JM, Destailats F, Malpuech-Brugère C, Moulin J, Bauman DE, Lock AL, Barbano DM, Mensink RP, Bezelgues JB, Chaumont P, Combe N, Cristiani I, Joffre F, German JB, Dionisi F, Boirie Y, Sébédio JL. [Do Trans fatty acids from industrially produced sources and from natural sources have the same effect on cardiovascular disease risk factors in healthy subjects? Results of the Trans Fatty Acids Collaboration \(TRANSFACT\) study](#). *Am J Clin Nutr*. 2008 Mar; 87 (3): 558-566. PMID: 18326592.

List of Excluded Articles with Reason

Articles	Reason for Exclusion
Baer DJ, Judd JT, Clevidence BA, Tracy RP. Dietary fatty acids affect plasma Markers of inflammation in healthy men fed controlled diets: A randomized crossover study . <i>Am J Clin Nutr</i> . 2004 Jun; 79 (6): 969-973. PMID: 15159225.	Does not address variables of interest. No direct comparisons
Chardigny JM, Malpuech-Brugère C, Dionisi F, Bauman DE, German B, Mensink RP, Combe N, Chaumont P, Barbano DM, Enjalbert F, Bezelgues JB, Cristiani I, Moulin J, Boirie Y, Golay PA, Giuffrida F, Sébédio JL, Destailats F. Rationale and design of the TRANSFACT project phase I: A study to assess the	Does not address question. Describes the rationale and design of the TRANSFACT

<p>effect of the two different dietary sources of trans fatty acids on cardiovascular risk factors in humans. <i>Contemp Clin Trials</i>. 2006 Aug; 27 (4): 364-373. Epub 2006 Apr 24. PMID: 16632411.</p>	<p>project phase 1.</p>
<p>Clifton PM, Keogh JB, Noakes M. Trans fatty acids in adipose tissue and the food supply are associated with myocardial infarction. <i>J Nutr</i>. 2004 Apr; 134 (4): 874-879. Erratum in: <i>J Nutr</i>. 2004 Jul; 134 (7): 1, 848. PMID: 15051840.</p>	<p>Does not address question. Examines both adipose tissue levels and dietary intake.</p>
<p>de Roos NM, Schouten EG, Katan MB. Trans fatty acids, HDL-cholesterol and cardiovascular disease. Effects of dietary changes on vascular reactivity. <i>Eur J Med Res</i>. 2003 Aug 20; 8 (8): 355-357. PMID: 12915329.</p>	<p>Does not address variables in question. No direct comparison</p>
<p>de Roos NM, Schouten EG, Scheek LM, van Tol A, Katan MB. Replacement of dietary saturated fat with trans fat reduces serum paraoxonase activity in healthy men and women. <i>Metabolism</i>. 2002 Dec; 51 (12): 1, 534-1, 537. PMID: 12489064.</p>	<p>Does not address question. Studies replacing saturated fat with TFA on PON1 activity and HDL.</p>
<p>Dyerberg J, Eskesen DC, Andersen PW, Astrup A, Buemann B, Christensen JH, Clausen P, Rasmussen BF, Schmidt EB, Tholstrup T, Toft E, Toubro S, Stender S. Effects of trans- and n-3 unsaturated fatty acids on cardiovascular risk markers in healthy males. An eight-week dietary intervention study. <i>Eur J Clin Nutr</i>. 2004 Jul; 58 (7): 1, 062-1, 070. PMID: 15220949</p>	<p>Does not address question. Examines cardiovascular risk markers of dietary enrichment with TFA or n-3 PUFA.</p>
<p>Jakobsen MU, Overvad K, Dyerberg J, Heitmann BL. Intake of ruminant trans fatty acids and risk of coronary heart disease. <i>Int J Epidemiol</i>. 2008 Feb; 37 (1): 173-182. Epub 2007 Dec 12. PMID: 18077475.</p>	<p>Does not address questions. No direct comparisons with iTrans.</p>
<p>Judd JT, Baer DJ, Clevidence BA, Kris-Etherton P, Muesing RA, Iwane M. Dietary cis and trans monounsaturated and saturated FA and plasma lipids and lipoproteins in men. <i>Lipids</i>. 2002 Feb; 37 (2): 123-131. PMID: 11908904.</p>	<p>Does not address question. Investigate post-prandial haemostasis.</p>
<p>Lichtenstein AH, Matthan NR, Jalbert SM, Resteghini NA, Schaefer EJ, AusmanLM. Novel soybean oils with different fatty acid profiles alter cardiovascular disease risk factors in moderately hyperlipidemic subjects. <i>Am J Clin Nutr</i>. 2006 Sep; 84 (3): 497-504. PMID: 16960162</p>	<p>Does not address question. Studies effect of selectively modified soybean oils.</p>
<p>Mensink RP. Effects of products made from a high-palmitic acid, trans-free semi-liquid fat or a high-oleic acid, low-trans semiliquid fat on the serum lipoprotein profile and on C-reactive protein concentrations in humans. <i>Eur J Clin Nutr</i>. 2008 May; 62 (5): 617-624. Epub 2007 Apr 18. PMID: 17440525</p>	<p>Does not address question or compare variables head to head in questions.</p>

<p>Mozaffarian D, Abdollahi M, Campos H, Houshiarrad A, Willett WC. Consumption of trans fats and estimated effects on coronary heart disease in Iran. <i>Eur J Clin Nutr.</i> 2007 Aug; 61 (8): 1, 004-1, 010. Epub 2007 Jan 31. PMID: 17268422.</p>	<p>Does not address question. Investigates intake of industrial TFA in Iranian homes.</p>
<p>Mozaffarian D, Clarke R. Quantitative effects on cardiovascular risk factors and coronary heart disease risk of replacing partially hydrogenated vegetable oils with other fats and oils. <i>Eur J Clin Nutr.</i> 2009 May; 63 Suppl 2: S22-S33 PMID: 19424216. Hand search.</p>	<p>Does not address question. Investigates exchange of trans fat for SFA, MUFA and PUFA</p>
<p>Müller H, Kirkhus B, Pedersen JI. Serum cholesterol predictive equations with special emphasis on trans and saturated fatty acids. An analysis from designed controlled studies. <i>Lipids.</i> 2001 Aug; 36 (8): 783-791. PMID: 11592728 Hand Search 05/30/09</p>	<p>Does not address question. Compares results of predictive equations.</p>
<p>Oomen CM, Ocké MC, Feskens EJ, van Erp-Baart MA, Kok FJ, Kromhout D. Association between trans fatty acid intake and 10-year risk of coronary heart disease in the Zutphen Elderly Study: A prospective population-based study. <i>Lancet.</i> 2001 Mar 10; 357(9258): 746-751. PMID:11253967</p>	<p>Overlap. Cited in review article by Jakobsen et al, 2006.</p>
<p>Sun Q, Ma J, Campos H, Hankinson SE, Manson JE, Stampfer MJ, Rexrode KM, Willett WC, Hu FB. A prospective study of trans fatty acids in erythrocytes and risk of coronary heart disease. <i>Circulation.</i> 2007 Apr 10; 115 (14): 1, 858-1, 865. Epub 2007 Mar 26. PMID: 17389261.</p>	<p>Does not address question. Studies the TFA contents in erythrocytes.</p>
<p>St-Onge MP, Aban I, Bosarge A, Gower B, Hecker KD, Allison DB. Snack chips fried in corn oil alleviate cardiovascular disease risk factors when substituted for low-fat or high-fat snacks. <i>Am J Clin Nutr.</i> 2007 Jun; 85 (6): 1, 503-1, 510. PMID: 17556685.</p>	<p>Does not address question. Did not compare variables in question.</p>
<p>Tholstrup T, Raff M, Basu S, Nonboe P, Sejrnsen K, Straarup EM. Effects of butter high in ruminant trans and monounsaturated fatty acids on lipoproteins, incorporation of fatty acids into lipid classes, plasma C-reactive protein, oxidative stress, hemostatic variables and insulin in healthy young men. <i>Am J Clin Nutr.</i> 2006 Feb; 83 (2): 237-243. PMID: 16469980.</p>	<p>Does not address question, but studies effects of rTFA alone.</p>